SOME NOTES ON AUSTRALIAN LAND SHELLS.

By Charles Hedley.

Plates xxix.-xxxii.

Plans had been made by the writer to prepare for local students an illustrated monograph of the land mollusca of Eastern Australia. Literature had been assembled and analysed; many drawings had been finished; a large collection of shells laid out for close examination and certain groups had been reviewed, when the undertaking came to a sudden unexpected end. Now, with much reluctance the project is relinquished. As much of this work as is sufficiently complete for publication is now presented as follows:—

Gyrocochlea, gen. nov.

Shell with three rounded adult whorls, usually wound in an ascending plane so as to form a biconcave disk with the umbilicus deeper than the spire. Protoconch smooth, flat, a whorl and a half. First sculpture consisting of spaced, elevated riblets, descrepant to the protoconch lip, older sculpture crowded, vertical riblets, spiral sculpture absent. Aperture simple, lip sharp, insinuate at the insertion; no internal lamellae. Type; *Helix vinitincta* Cox.

Members of this genus inhabit the rain forests of New South Wales and Queensland. Probably *Helix antialba* represents it in the rain forest of North-West Tasmania. Ancey has assigned my type to his New Caledonian genus *Monomphalus*, but the type of that, *M. heckelianus*, differs by a spirally striated protoconch. *Allodiscus* from New Zealand, according to the type, *A. dimorphus*, has a rather larger protoconch without spiral striae, but followed by consonant fine and crowded ribbing.

Gyrocochlea concinna, sp. nov.

(Plate xxix., figs. 1-3.)

Shell minute, globose-discoid. Colour; adult shell with alternate segments of buff and cinnamon, protoconch dark purple with a pearly lustre. Whorls four closely wound, each rising above its predecessor. Sculpture; last whorl with eighty-two fine, spaced, regular riblets. Spire a deep basin with evenly descending sides. Umbilicus cup-shaped exposing all the previous whorls. Maj. diam. 2.7, min. diam. 2.3, height 1.5 mm.

This account is based on a single, probably immature, specimen. It is the most northern of the genus yet reported. The combination of colour rays and a vertex projecting above the spire distinguishes the species.

Hab.—Queensland: "Cardwell scrubs, North Queensland, 1871" (Ex Brazier, probably "28 miles inland from Cardwell, at an elevation of 3,500 ft., Beddome," vide under *H. macgillivrayi*, Journ. of Conch. i., 1877, p. 269).

Gyrocochlea conferta, sp. nov.

(Plate xxix., figs. 4-6.)

Shell small discoidal. Colour uniform ochraceous tawny. Whorls four, gradually rising till the third whorl and then commencing a slight descent. Sculpture; on the first fifty-five, on the last whorl a hundred and twenty-five lamellate riblets, the last being closely packed. Spire shallow. Umbilicus wide and deep. Maj. diam. 4.1, mn. diam. 3.4, height 2.3 mm.

This has a general resemblance to *G. omicron*, from which *G. conferta* is easily distinguished by smaller size, flatter spire, more excavate umbilicus, denser riblets and uniform colour. It occurs south of the territory occupied by *G. omicron*.

Hab.—N.S. Wales: Port Stephens (type, Rev. R. L. King), Coolongolook (C. Laseron), Ellerslie, Wallis Lake (C. Hedley).

Gyrocochlea convoluta, sp. nov.
(Plate xxix., figs. 7-9.)

Related to *G. vinitincta* but differing by being smaller, darker, namely auburn, having the whorls more closely rolled together, the spire more deeply sunk, the riblets more membranous and further apart, namely seventy-seven on the last whorl, with several fine radial hair lines in their interstices. Maj. diam. 6.5, min. diam. 5, alt. 4 mm.

Hab.—Queensland: Beaudesert (type, Dr. R. Pulleine), Camerunga (S. W. Jackson).

Gyrocochlea eurythma, sp. nov.
(Plate xxix., figs. 10-12.)

Shell small and discoidal. Colour uniform cinnamon. Whorls four, wound almost in the same plane; the two first lie in a small hollow formed by the elevation of the third while the last whorl descends slightly. Sculpture, the first whorl carries fifty-four and the last one hundred and ten, close fine radial riblets. Umbilicus wide, exposing all previous whorls. Maj. diam. 3, min. diam. 2.5, height 1.5 mm.

Hab.—N.S. Wales: "Northern Rivers, N.S.W., Petterd" (Cox Coll., type), E. Macleay River (Cox Coll.), Port Stephens (Rev. R. L. King).

Gyrocochlea impressa, sp. nov.
(Plate xxx., figs. 13-15.)

Shell small, compressed. Colour uniform cinnamon-buff. Whorls four and a half, rounded, closely wound, ascending for the entire coil. Sculpture fine, dense and even riblets, one hundred and thirty-two on the last whorl. Spire a deep cup. Umbilicus moderately wide. Maj. diam. 4, min. diam. 3.25, height 2.5 mm.

This species is distinguished by small size, greater height in proportion to breadth and the continual rise of the whorls, by which the vertex of the aperture overtops the preceding whorl. It is a southern outlier of the genus.

Hab.—N.S. Wales: Kurrajong (C. T. Musson, a single specimen).

Gyrocochlea omicron, Pfeiffer.
(Plate xxx., figs. 16-18.)

Helix omicron Pfeiffer, Zeit. f. Malak. viii., Oct., 1851, p. 128; *Id.*, Pfeiffer, Mon. Hel. Viv., iii., 1853, p. 109, vii., 1876, p. 186; *Id.*, Pfeiffer, Conch. Cab., ii., 1854, p. 457, Pl. 155, figs. 13-17; *Id.*, Cox, Monogr. Austr. Land Shells, 1868, p. 18, Pl. 10, fig. 1; *Id.*, Petterd, Journ. de Conch. xxv., 1877, p. 359; *Diplomphalus omicron* Tryon, Man. Conch., i., 1885, p. 115, Pl. 24, fig. 79; *Monomphalus omicron* Ancey, Bull. Soc. Malac. France, v., 1888, p. 359; *Charopa omicron* Hedley and Musson, Proc. Linn. Soc. N.S.W., (2), vi., 1891, p. 553; *Helix ammonitoides* Reeve, Conch. Icon., vii., June, 1854, Pl. 181, fig. 1246; *Id.*, Cox, Cat. Austr. Land

Shells, 1864, p. 14. Not *Helix ammonitoides* Brazier, Proc. Zool. Soc., 1870, p. 661.

This species is much smaller than *G. vinitincta*, not so high in proportion to the breadth, the spire is not so deeply sunk and the different colour is a ready recognition mark.

Shell small discoidal. Colour pale buff painted with about fifteen jagged, radial stripes of terra cotta, as wide as their interstices. The first whorl carries thirty-seven riblets, which growing more crowded increase on the last whorl to one hundred and twenty-five. Maj. diam. 6, min. diam. 5.5, alt. 3 mm.

Hab.—Pfeiffer originally described this from Australia, but in 1876 he erroneously substituted the habitat New Zealand, where most of the alphabet series live. N.S. Wales: Richmond and Clarence Rivers (Macgillivray), Brunswick and Tweed Rivers (Petterd). Queensland: Macpherson Range (Lower), Eagle Scrub, Brisbane (Brazier), Canungera (Jackson), Stanley River (Petterd), Miriam Vale, Warro, Cania, Gympie, and North Pine River (Musson).

Gyrocochlea planorbis, sp. nov.

(Plate xxx., figs. 19-21.)

Shell small, discoidal. Colour uniform cinnamon. Whorls four, wound horizontally. Sculpture; first whorl with forty, last with one hundred and eight narrow thread-like riblets. Spire flat, except that the protoconch is a little sunken. Umbilicus wide, basin shaped, with sloping whorls. Maj. diam. 3.3, min. diam. 2.7, height 1.5 mm.

Hab.—N.S. Wales: Port Stephens (type, Rev. R. L. King), Hastings River (A. R. McCulloch), Macleay River and Nambucca Rivers (Cox. Coll.).

Gyrocochlea prava, sp. nov.

(Plate xxx, figs. 22-24.)

Shell small, compact. Colour uniform ochraceous-tawny. Whorls four and a half, rounded, the earlier gradually ascending, the entire last whorl slowly and evenly descending, leaving the antipenultimate projecting above it. Sculpture; on the first whorl are thirty-eight spaced riblets which increase with growth till they amount to one hundred and thirty-five on the final whorl. Spire a shallow depression. Umbilicus moderately wide. Aperture vertical, lip curved at base and vertex, recurved at the sutures and periphery. The step down from penultimate to final whorl is a useful recognition mark for this species. Maj. diam. 4.3, min. diam. 3.5, height 2.5 mm.

Hab.—N.S. Wales: Upper Tweed River (Petterd).

Gyrocochlea recava, Hedley.

Endodonta recava Hedley, Proc. Linn. Soc. N.S.W., xxxvii., 1912, p. 267, Pl. 10, figs. 58-60.

Hab.—Queensland: Finch Hatton (type, S. W. Jackson).

Gyrocochlea stroudensis, Cox.

(Plate xxxi., figs. 25-27.)

Helix stroudensis Cox, Cat. Austr. L. Shells, 1864, p. 20; *Id.*, Cox, Ann. Mag. Nat. Hist., Sept. 1864, p. 182; *Id.*, Pfeiffer, Mon. Hel. Viv., v., 1868, p. 182; *Id.*, Cox, Monogr. Austr. L. Shells, 1868, p. 20, Pl. 11, fig. 1; *Id.*, Tryon,

Man. Conch., iii., 1887, p. 25, Pl. 4, figs. 28, 29. Not *Endodonta stroudensis* Ancey, Journ. de Conch. xlix., 1901, p. 145.

Shell minute, turbinate, perforate. Colour uniform tawny. Whorls four and a half, each rising above its follower, the last half whorl descending more rapidly than the others. Sculpture; on the first whorl forty-eight, on the last one hundred and five elevated, curved, rather irregularly spaced, lamellate riblets. Spire a low dome. Umbilicus a narrow perforation, partly choked by the overhang of the last whorl, not exposing previous whorls. Maj. diam. 2.5, min. diam. 2.0, height 1.5 mm.

This species differs from typical forms of the genus by the exsert spire. My description is based on the original type presented by the collector, Rev. R. L. King. This enables me to state that there are no spiral striae as figured by Cox and that the description of Ancey refers to a different shell. The species has not been taken again and seems to be rare or local.

Hab.—N.S. Wales: Stroud (type, King).

Gyrocochlea vinitincta, Cox.

(Plate xxxi., figs. 28-31.)

Helix vinitincta Cox, Monogr. Austr. L. Shells, 1868, p. 18, Pl. 1, figs. 6, 6a; *Id.*, Pfeiffer, Mon. Hel. Viv., vii., 1876, p. 186; *Id.*, Petterd, Journ. de Conch., xxv., 1877, p. 360; *Diplomphalus vinitinctus* Tryon, Man. Conch., i., 1885, p. 115, Pl. 24, figs. 88, 89; *Id.*, Hedley Proc. Roy. Soc. Q'land, v., 1888, p. 152, vi. 1889, p. 102; *Monomphalus vinitinctus* Ancey, Bull. Soc. Malac. France, v., 1888, p. 359; *Endodonta vinitincta* Shirley, Q'land Naturalist, iii., 1921, p. 34.

Shell large for the group, thin, contour discoidal. Colour amber brown, either uniform or streaked with ochraceous tawny. Whorls four and a half, of which one and a half compose the protoconch, rounded, rapidly enlarging, coiled in a slightly ascending plane, as far as the fourth whorl, then slightly descending; the shell is thus biconcave but the umbilical hollow is much deeper and narrower than the upper cavity; when full grown the vertex of the aperture has descended to the level of the summit of the body whorl, but at an earlier growth stage the vertex of the aperture projects above the rest, thus giving the shell a different outline. The suture runs in a deep groove. Protoconch is white, smooth and flat, of a whorl and a half, terminating in a slightly everted lip. Sculpture; the earliest sculpture consists of spaced lamellate riblets unconformable with the lip of the protoconch (Pl. C., fig. 31), of these forty four go to the first whorl; gradually, as growth proceeds, these become smaller and closer, the last whorl carries about one hundred and thirty, regular, closely packed thread riblets; springing from the suture the riblets bend obliquely forward, spread and thicken to the vertex, descend vertically, describe a shallow backward curve across the periphery, grow thinner and closer on the base and enter the umbilicus in a forward sweep. The spire lies in a shallow cup, the depth of which is a variable feature. The umbilicus is a quarter of the shell's diameter with vertical sides and exposing all the previous volutions. Aperture vertical, elliptical, lip thin, neither everted nor inverted. Inner lip with an advanced subnacreous callus pad. No internal lamellae. Maj. diam. 8.5, min. diam. 7, height 5.5 mm.

Hab.—N.S. Wales: Upper Richmond River, under logs in the brushes (type, Macgillivray), Lismore, Tintenbar, Brunswick River, very rare (Petterd), Broken Head, Byron Bay (Jackson), Big Scrub, of Murwillumbah, Byangum Scrub (Lower).

Queensland: Little Nerang Creek (Hedley), Queensland National Park (Shirley).

RHOPHODON, gen. nov.

A new genus of the ENDODONTIDAE. Shell minute, radially striped, discoidal, with wide saucer-shaped umbilicus, sculpture dense minute riblets; aperture furnished with a few deeply-seated lamellae on either side. Type: *R. peregrinus* Hedley. Habitat, rain forests of the north coast of New South Wales.

There is a group of small South Pacific snails which resemble *Charopa* but differ by having a series of lamellae variously disposed within the aperture. Until anatomical research has made further progress it will not be decided how the occurrence of these lamellae can be correlated with those structural characters on which a natural classification must depend. For it may be that different groups have independently acquired (or lost) such armature and that a really natural classification may bind together some toothed with other toothless forms. Until further data from the animal is obtained the simplest arrangement is to divide these small snail shells into toothed and toothless forms.

A first step in classifying the toothed snails of the Pacific was taken when Beck in 1837 suggested "*Pitys*" for the reception of *P. oparana* Beck, from Opara = Rapa Island in the Tubuai, Austral or Dangerous Archipelago. Pilsbry points out that Beck's genus must lapse because it depended on an undescribed species; as later writers gave a different meaning to *Pitys* the loss of that name is the less regretted. Probably Beck had in mind a shell described two years later as *Helix opanica* by Anton and figured as *Helix oparica* by Reeve in 1852. This, *H. lamellosa* Ferussac and others were legitimately grouped in 1850 by Albers into his genus *Endodonta.*

Hutton noticed in 1883 (Trans. N.Z. Inst. xv., p. 135) that a New Zealand snail had a fortified aperture and he placed it on that account in the North American genus *Strobila.* Seeing that this southern species was incompatible with *Strobila,* Ancey in 1888 (Bull. Soc. Mal. France, v., p. 372) proposed for it a new genus *Ptychodon;* probably this name should be disqualified on account of *Ptychodus* Agassiz, 1839 (Pois. foss. iii., p. 150). Unaware of action by Ancey, Suter proposed for the same group, first *Huttonella,* already occupied in mollusca by Pfeiffer, and then *Maoriana* (Trans. N.Z. Inst., xxxiii., p. 96). For a group with hooks on the palatal lamellae Pilsbry has erected *Thaumatodon* (Man. Conch., ix., 1893, p. 26), with a subgroup *Nesophila.*

An early but neglected name in this connection is *Plesiopsis,* Ancey (Bull. Soc. Malac. France, v., 1888, p. 372) of which the genotype is a rare New Caledonian shell, *Helix lombardeaui* Montrouzier, radially striped, imperforate, 10 mm. in diameter, with one or two strong palatal lamellae. The last to be proposed is *Norfolcioconcha* Preston (Ann. Mag. Nat. Hist., 8 ser. xii., Dec., 1913, p. 535) from Norfolk Island, genotype *Endodonta norfolkensis* Hedley (Rec. Aust. Mus., iii., 1899, p. 152, Pl. 28, figs. 4, 5, 6).

Comparisons between *Rhophodon* and genera beyond Australia are as follows:

The only one smaller is *Norfolcioconcha,* from Norfolk Island, this shell is turbinate with an elevated spire and small perforation; the remarkable feature is the development of the parietal lamellae, the two blades of which plunge deep into the aperture.

Maoriana, from New Zealand, is sculptured by spaced delicate lamellae, the whorls are tightly rolled leaving a small perforation, the aperture has a larger diameter and is furnished with palatal plicae set even and close like the teeth of a comb.

Thaumatodon, from Rarotonga, has a general resemblance in form and colour, but the aperture has more lamellae carrying curved processes.

Endodonta, from Raiatea, is of similar contour, but the shell is much larger and has a keeled periphery, the armature of the aperture is simpler.

Libera, from Rarotonga, is about 5 mm. in diameter, has a dome top, sharp keel, flat base coarse radial riblets, umbiliens choked, sharp keel, flat base, coarse radial riblets, umbilieus choked and armature reduced to a few small spaced threads.

Nesophila, from Hawaii, is largest of all attaining a diameter of 12 mm., the contour resembles *Rhophodon,* the mouth armature is reduced to a minimum, consisting of a series of fine thread-like parietal lamellae.

Plesiopsis, from New Caledonia, is a bulky form, 10 mm. in diameter, imperforate, the armature reduced to two palatal lamellae.

Rhophodon consobrinus, n.sp.

(Plate xxxi., figs. 32-34.)

? *Endodonta stroudensis* Ancey (not Cox), Journ. de Conch., xlix., 1901, p. 145.

This form closely resembles *R. peregrinus,* but is larger, the umbiliens comparatively deeper, the ribbing coarser and the labial lamellae project further, the longest extending outside the lip. Maj. diam. 2.5, min. diam. 2, height 1 mm.

Hab.—N.S. Wales: Richmond and Tweed Rivers (W. F. Petterd in Cox Coll.), Tyagarah (Lower).

Rhophodon contortus, sp. nov.

(Plate xxxii., figs. 35-37.)

Shell minute, discoidal. Colour chestnut, irregularly streaked with raw sienna Whorls four including the protoconch, this is smooth and prominent and consists of a whorl and a quarter; the last whorl slowly and slightly descends and the penultimate rises to correspond; at the maximum height the penultimate partly overlaps its predecessor; the vertex of the last whorl is compressed into a ridge between which and the inner whorl runs a deep sutural furrow, the outer side of this whorl is first flattened and then constricted, causing the periphery to become subcarinate. Sculpture fine close arenate growth lines, the upper surface being harsh but the lower smooth and glossy. Umbilicus wide and shallow. Aperture subrhomboidal; armature, one prominent exsert, and deeply entering, palatal fold, running along the periphery, and two deep seated, short parietals on the base. Maj. diam. 2.0 mm., min. diam. 1.5 mm., height 0.9 mm.

Hab.—N.S. Wales: Sherwood on the Maeleay River (C. Laseron).

Rhophodon peregrinus, sp. nov.

(Plate xxxii., figs. 38-40.)

Shell minute, discoidal. Colour; centre pearl grey, adult whorls buff crossed by about a dozen irregular rays of russet brown. Whorls rounded, slightly ascending as far as the final half whorl which descends a little, protoconch of a whorl and a half, rather inflated, sometimes slightly tilted, adult whorls three. Sculpture; the initial whorl is radially striated, the adult whorls carry fine close regular riblets which amount to about one hundred and fifty on the last whorl. Spire a little concave. Umbilicus very wide and shallow. Aperture; the lamellae on the outer whorl are discernible through the shell, they commence about one-tenth of a whorl behind the aperture and continue backwards for about one-eighth of a whorl, half grown shells have their lamellae in the same position as adults, but as lamellae do not continue deep within the shell it is apparent that they are resorbed; the

series are thus disposed, on the inner lip one minute and deep seated lamella is just beneath the suture, the next is on the periphery, a little lower is the tallest and farthest exsert, closely followed by another not so prominent nor protruding so far, at an equal interval is the lowest, a small deeply seated fold which leaves a small sinus at the base of the columella; the tallest palatal is opposite the lower of the major pair of columella folds, beneath it are three or four small evenly spaced lamellae and finally there is a small one above situated between the suture and the vertex. Maj. diam. 1.9, min. diam. 1.5, height 0.75 mm.

Hab.—N.S. Wales: Tweed River (type, Petterd in Cox Coll.), Scrub at Cape Byron (Lower in Cox Coll.).

SUTERIA, Pilsbry.

Patulopsis, Suter, Trans. N.Z. Inst., xxiv., 1891, p. 270 (not *Patulopsis* Strebel and Pfeffer, Mexik. Land Sussw. Conch., iv., 1879, p. 16) type *Helix ide* Gray; *Suteria* Pilsbry, *nom. mut.* Nautilus, vi., 1892, p. 56; *Id.*, Man. Conch., ix., 1893, p. 17; *Id.*, Suter, Man. N.Z. Moll., 1914, p. 670.

Hitherto *Suteria* has been considered to be peculiar to New Zealand and the following species is referred to it with hesitation. The type, *S. ide*, differs indeed from *S. seticostata* by having two more whorls and is by that much larger; but correspondence in the primary character of the bristly ribs, of the texture, and of the shape, of the shell lends some support to the identification.

SUTERIA SETICOSTATA, sp. nov.

(Plate xxxii., figs. 41-44.)

Shell depressed and widely umbilicate, unusually thin and fragile. Colour buff, on which ground are about a dozen, radially ziczag, chocolate flames. Whorls four and a half, including the protoconch, rounded, the last gradually and slightly descending; protoconch a whorl and a half, smooth and polished. Sculpture; elevated spaced membranous ribs, on the first whorl thirty-two, on the last fifty-seven, in their interstices run four to six, microscopic, radial hair-lines, a faint spiral sculpture is sometimes indicated; on a fresh shell the major ribs carry slender upright bristles (fig. 44), regularly spaced and reaching as high as half a millimetre, but these are fragile and soon lost from worn shells. Spire low, convex. Umbilicus wide, exposing all earlier whorls. Aperture a little oblique. Maj. diam. 3.8, min. diam. 3.0, height 1.8 mm.

Hab.—N.S. Wales: Dorrigo, Nov. 1910, under logs (type, S. W. Jackson); Clarence River (Cox Coll.); Big Scrub, Murwillumbah (C. Laseron); Lismore, Ballina and Byron Bay (Lower in Cox Coll.).

EXPLANATION OF PLATES.

Plate xxix.

Figs. 1-3, *Gyrocochlea concinna,* Hedley, Type.
4-6, „ *conferta,* Hedley, Type.
7-9, „ *convoluta,* Hedley, Type.
10-12, „ *eurythma,* Hedley, Type.

Plate xxx.

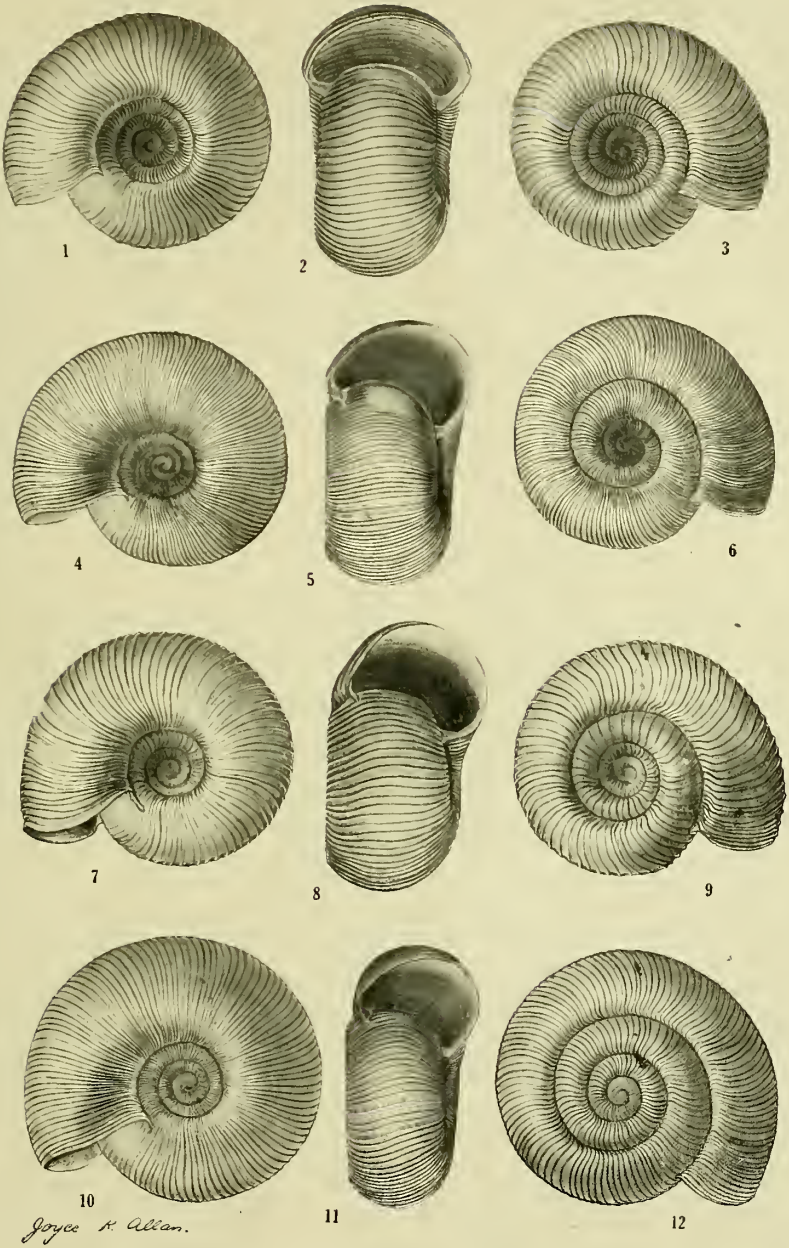
Figs. 13-15, *Gyrocochlea impressa,* Hedley, Type.
16-18, „ *omicron,* Pfeiffer.
19-21, „ *planorbis,* Hedley, Type.
22-24, „ *prava,* Hedley, Type.

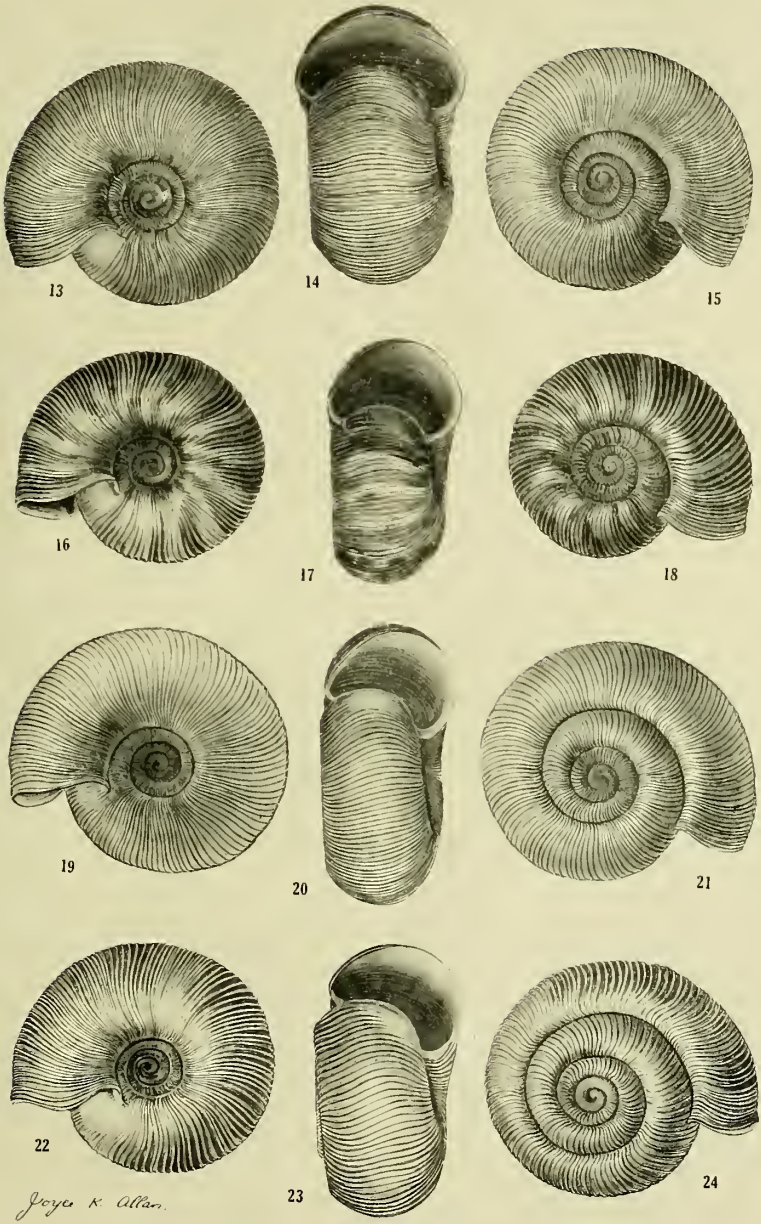
Plate xxxi.

Figs. 25-27, *Gyrocochlea stroudensis,* Cox.
28-31, „ *vinitincta,* Cox.
32-34, *Rhophodon consobrinus,* Hedley, Type.

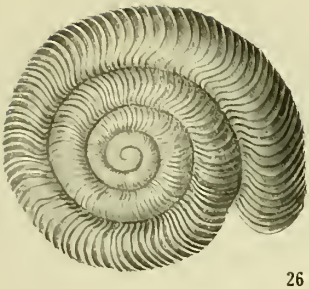
Plate xxxii.

Figs. 35-37, *Rhophodon contortus,* Hedley, Type.
38-40, „ *peregrinus,* Hedley, Type.
41-44, *Suteria seticostata,* Hedley, Type.


1
2
3
4
5
6
7
8
9
10
11
12
Joyce K. Allan.

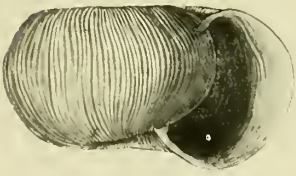

13
14
15
16
17
18
19
20
21
22
23
24
Joyce K. Allan.

25



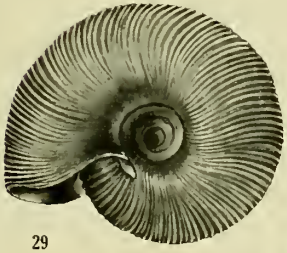
26

27

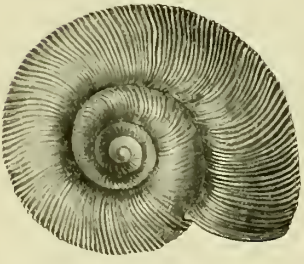


28

31

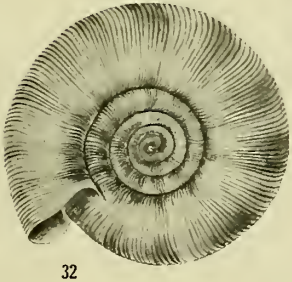


29

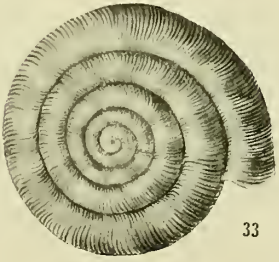


30

34

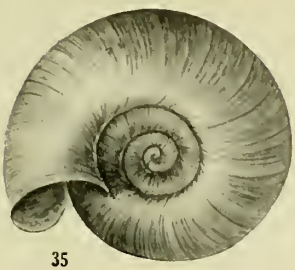


32



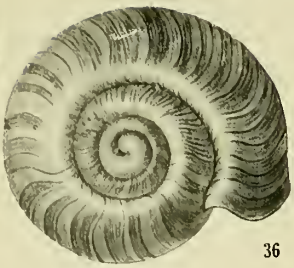
33

Joyce & Allan



35

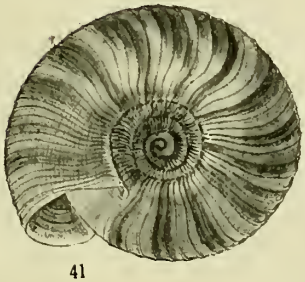
37



36

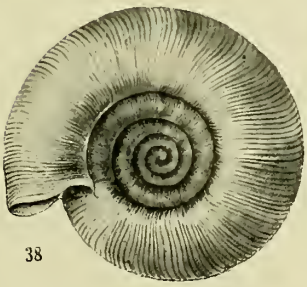
43

44

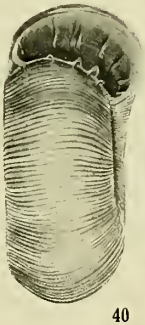


41

42



38



40

39

Joyce ir Allan.